

CLAIMS

What is claimed is:

- 1 ~~1.~~ An apparatus comprising:
- 2 an optical transmitter transmitting a signal light to a transmission path,
- 3 wherein the signal light has a corresponding rise time and fall time and the
- 4 transmitter adjusts at least one of the rise time and fall time.
- 1 *sub*
- 2 *al*
- 3 2. An apparatus as in claim 1, wherein the optical transmitter comprises:
- 4 an adjusting circuit adjusting said at least one of the rise time and fall
- 5 time.
- 6 3. An apparatus as in claim 1, wherein the optical transmitter comprises:
- 7 a light source emitting a light;
- 8 a modulation signal generator generating an electrical modulation signal
- 9 having a corresponding rise time and fall time;
- 10 an adjusting circuit adjusting at least one of the rise time and fall time of
- 11 the electrical modulation signal; and
- 12 a modulator modulating the emitted light with the adjusted electrical
- 13 modulation signal, to thereby produce said signal light having at least one of the
- 14 rise time and fall time of the signal light adjusted.
- 1 4. An apparatus as in claim 1, wherein the transmitter adjusts both the rise
- 2 time and the fall time.
- 1 *sub*
- 2 *co*
- 3 5. An apparatus as in claim 2, wherein the adjusting circuit adjusts both the
- 4 rise time and the fall time.

1 6. An apparatus as in claim 1, wherein the transmitter lengthens both the
2 rise time and the fall time.

1 7. An apparatus as in claim 1, wherein the transmitter shortens both the rise
2 time and the fall time.

1 8. An apparatus as in claim 1, wherein the transmitter adjusts both the rise
2 time and the fall time to maintain amplitude deterioration and phase margin of
3 the transmitted signal light within a specific range.

1 9. An apparatus as in claim 1, further comprising:
2 a receiver receiving the transmitted signal light through the transmission
3 path, wherein the transmitter adjusts said at least one of the rise time and fall
4 time in accordance with characteristics of the signal light at the receiver.

1 10. An apparatus as in claim 3, further comprising:
2 a receiver receiving the transmitted signal light through the transmission
3 path, wherein the adjusting circuit adjusts said at least one of the rise time and
4 fall time of the electrical modulation signal in accordance with characteristics of
5 the signal light at the receiver.

1 11. An apparatus as in claim 1, further comprising:
2 a receiver receiving the transmitted signal light through the transmission
3 path, wherein the transmitter performs one of the group consisting of
4 lengthening both the rise time and the fall time in accordance with
5 characteristics of the signal light at the receiver,
6 shortening both the rise time and the fall time in accordance with
7 characteristics of the signal light at the receiver, and

8 adjusting both the rise time and the fall time to maintain
9 amplitude deterioration and phase margin of the transmitted signal light within a
10 specific range in accordance with characteristics of the signal light at the
11 receiver.

1 12. An apparatus as in claim 1, further comprising:
2 a receiver receiving the transmitted signal light through the transmission
3 path; and
4 a controller controlling the transmitter to adjust said at least one of the
5 rise time and fall time in accordance with characteristics of the signal light at
6 the receiver.

Sub C4
1 13. An apparatus as in claim 3, wherein the modulator modulates the emitted
2 light via one of the group consisting of optical phase modulation and optical
3 frequency modulation.

1 14. An apparatus as in claim 1, further comprising:
2 a dispersion compensator compensating for wavelength dispersion
3 characteristics of the transmission path.

1 15. An apparatus as in claim 1, further comprising:
2 a plurality of said optical transmitters, each transmitting a respective
3 signal light having a different wavelength than the signal lights of the other
4 optical transmitters; and
5 an optical multiplexer multiplexing the signal lights together into a
6 wavelength division multiplexed (WDM) signal which is transmitted through the
7 transmission path.

1 ~~16.~~ An apparatus comprising:
2 *sub a3* an adjusting circuit adjusting at least one of a rise time and a fall time of
3 an electrical modulation signal; and
4 a modulator modulating a light with the adjusted electrical modulation
5 signal.

1 17. An apparatus as in claim 16, wherein the adjusting circuit adjusts both
2 the rise time and the fall time.

1 18. An apparatus as in claim 16, wherein the adjusting circuit lengthens both
2 the rise time and the fall time.

1 19. An apparatus as in claim 16, wherein the adjusting circuit shortens both
2 the rise time and the fall time.

1 20. An apparatus as in claim 16, wherein the modulated light is transmitted
2 through a transmission path, the adjusting circuit adjusting both the rise time
3 and the fall time to maintain amplitude deterioration and phase margin of the
4 transmitted, modulated light within a specific range.

1 21. An apparatus as in claim 16, wherein the modulated light is transmitted
2 through a transmission path, the apparatus further comprising:
3 a receiver receiving the transmitted, modulated light through the
4 transmission path, wherein the adjusting circuit adjusts said at least one of the
5 rise time and fall time in accordance with characteristics of the modulated light
6 at the receiver.

1 22. An apparatus as in claim 16, wherein the modulated light is transmitted
2 through a transmission path, the apparatus further comprising:
3 a receiver receiving the transmitted, modulated light through the
4 transmission path; and
5 a controller controlling the adjusting circuit to adjust said at least one of
6 the rise time and fall time in accordance with characteristics of the signal light
7 at the receiver.

1 23. An apparatus as in claim 16, wherein the modulator modulates the light
2 via one of the group consisting of optical phase modulation and optical
3 frequency modulation.

1 24. An apparatus as in claim 16, wherein the modulated light is transmitted
2 through a transmission path, the apparatus further comprising:
3 a dispersion compensator compensating for wavelength dispersion
4 characteristics of the transmission path.

1 25. An apparatus as in claim 16, wherein the adjusting circuit comprises:
2 a electrical amplifier amplifying the electrical modulation signal; and
3 a filter filtering the amplified electrical modulation signal.

1 26. An optical communication system comprising:
2 a transmitter including an adjusting circuit adjusting at least one of a rise
3 time and a fall time of an electrical modulation signal, and a modulator
4 modulating a light with the adjusted electrical modulation signal, the transmitter
5 transmitting the modulated light through a transmission path;
6 a receiver receiving the transmitted, modulated light through the
7 transmission path; and

8 a controller controlling the adjusting circuit to adjust said at least one of
9 the rise time and fall time in accordance with characteristics of the modulated
10 light at the receiver.

1 27. An optical communication system as in claim 26, wherein the controller
2 controls the adjusting circuit to perform one of the group consisting of
3 lengthening both the rise time and the fall time in accordance with
4 characteristics of the modulated light at the receiver,
5 shortening both the rise time and the fall time in accordance with
6 characteristics of the modulated light at the receiver, and
7 adjusting both the rise time and the fall time to maintain
8 amplitude deterioration and phase margin of the modulated light within a
9 specific range in accordance with characteristics of the modulated light at the
10 receiver.

1 28. An apparatus comprising:
2 an adjusting circuit adjusting at least one of a rise time and a fall time of
3 a modulation signal; and
4 a modulator modulating a light with the adjusted modulation signal.

1 29. An apparatus as in claim 28, wherein the adjusting circuit performs one
2 of the group consisting of:
3 adjusting both the rise time and the fall time,
4 lengthening both the rise time and the fall time, and
5 shortening both the rise time and the fall time.

1 30. An apparatus as in claim 28, wherein the modulated light is transmitted
2 through a transmission path, the apparatus further comprising:

3 a receiver receiving the transmitted, modulated light through the
4 transmission path, wherein the adjusting circuit adjusts said at least one of the
5 rise time and fall time in accordance with characteristics of the modulated light
6 at the receiver.

1 31. An apparatus as in claim 28, wherein the modulated light is transmitted
2 through a transmission path, the apparatus further comprising:

3 *Sub*
4 *as*
a receiver receiving the transmitted, modulated light through the
transmission path; and

5 a controller controlling the adjusting circuit to adjust said at least one of
6 the rise time and fall time in accordance with characteristics of the signal light
7 at the receiver.

1 32. An apparatus as in claim 28, wherein the adjusting circuit comprises:
2 an amplifier amplifying the modulation signal; and
3 a filter filtering the amplified modulation signal.

1 33. A method comprising:
2 *Sub*
3 *a-a*
adjusting at least one of a rise time and a fall time of a signal light; and
transmitting the adjusted signal light through a transmission path.

1 34. A method as in claim 33, further comprising:
2 receiving the transmitted signal light from the transmission path, wherein
3 said adjusting adjusts said at least one of the rise time and the fall time in
4 accordance with characteristics of the received signal light.

1 35. A method comprising:
2 *Sub*
3 *a-10*
adjusting at least one of a rise time and a fall time of a modulation

3 signal;

4 modulating a light with the adjusted modulation signal; and
5 transmitting the modulated light through a transmission path.

1 36. A method as in claim 35, further comprising:

2 receiving the transmitted modulated light through the transmission path,
3 wherein said adjusting adjusts at least one of the rise time and fall time in
4 accordance with characteristics of the received modulated light.

1 37. An apparatus comprising:

2 means for adjusting at least one of a rise time and a fall time of a
3 modulation signal; and
4 a modulator modulating a light with the adjusted modulation signal.